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Department on our environmental monitoring systems

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Author: Peter Hyde

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- Waste Management – Integrated Planning of Enduring Mission
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- Waste Management – Radioactive and Hazardous Waste Characterization
- Waste Management – Transportation and Waste Stream Characterization Services
- Waste Management – Waste Characterization and Tracking System (WCATS)



Environmental Stewardship

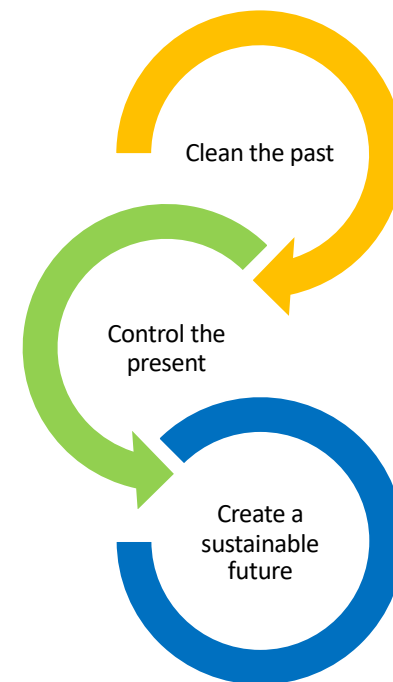
The Laboratory's Governing Policy on the Environment

"We are committed to act as stewards of our environment to achieve our mission in accordance with all applicable environmental requirements. We set continual improvement objectives and targets, measure and document our progress, and share our results with our workforce, sponsors, and public. We reduce our environmental risk through legacy cleanup, pollution prevention, and long-term sustainability programs."

ENVIRONMENTAL GRAND CHALLENGES

The Laboratory will experience changes to the mission and operations over the next several decades. Our long-term strategy for environmental stewardship and sustainability is guided by these seven grand challenges:

- Collaborate with stakeholders and tribal governments to ensure that LANL's impact on the environment is as low as reasonably achievable
- Remove and stabilize pollutants from the Manhattan Project and Cold War eras
- Protect water resource quality and reduce water use
- Eliminate industrial emissions, discharges, and releases to the environment
- Protect human and environmental health by managing and restoring lands
- Produce zero radioactive, hazardous, liquid, or solid wastes
- Use energy efficiently while creating sustainable energy sources



Environmental Management

As required by DOE Order 436.1, LANL is third-party certified to the International Standard ISO 14001:2015 Environmental Management Systems. The Environmental Management System (EMS) encompasses all work at LANL. The EMS framework spans and connects environmental protection and improvement from senior management to worker levels.

KEY ATTRIBUTES

- Senior leadership involvement
- Emphasizes continuous improvement
- Provides recurrent evaluation and monitoring of environmental performance
- Focuses on systems and process management
- Encourages early identification of changes in requirements and risks to mission
- Supports site-wide environmental compliance and implementation of legal and other requirements

Regulator: DOE

DOE Order 436.1 -Departmental
Sustainability



POLICIES & PROCEDURES

- All environmental policies and procedures are elements of the Laboratory's EMS
- SD 400 *Environmental Management System* is the parent procedure for the LANL EMS

TRAINING

- The Environmental Awareness course is required biannually for all workers and subcontractors

ACTIVITIES THAT SUPPORT CERTIFICATION TO ISO 14001

- Regular Environmental Senior Management Steering Committee meetings
- External certification and surveillance audits
- Internal management assessments
- A methodology for environmental risk identification and management: every Directorate and the Director's Office have their own, annual Environmental Action Plan

SD 400 Environmental Management System

The System Description (SD) for the Laboratory's Environmental Management System streamlines the guidance to Laboratory workers regarding environmental regulations and compliance. It directs workers to the Integrated Review Tool, describes environmental communications, and provides an overview of the annual cycle of environmental risk assessment and environmental action plan development undertaken by each directorate.

KEY MESSAGES IN SD 400

- The Integrated Review Tool must be engaged for all new and modified activities and projects at the Laboratory – this is how environmental compliance requirements are identified and communicated
- Early planning is essential for successful, compliant mission execution
- Waste Management Coordinators must be engaged before starting any work that will generate waste



Pollution Prevention

The goal of the Laboratory's pollution prevention efforts is to reduce or eliminate waste, emissions, and effluent discharge whenever possible. Successful pollution prevention improves worker health and safety, reduces negative environmental and social impacts, improves the efficiency and effectiveness of LANL operations, and has a positive return on financial investment.

GOAL: PREVENTION THROUGH EARLY ACTION

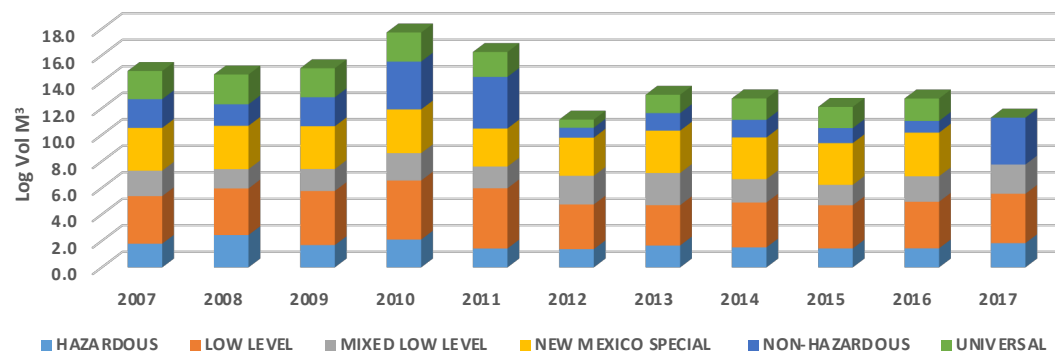
The goal of the Pollution Prevention Program is the reduction of pollutants of all types at their source, at the design stage whenever possible. Methods and outcomes include:

- Sustainable procurement
- Use of intrinsically safe materials
- Reductions in discharges to air, water, and waste
- Reductions in materials use, including water and energy

ACCOMPLISHMENTS

- Funded plasma physics switch design project that increases productivity 10-20x and eliminates use of sulfur hexafluoride
- Funded upgrade to Nuclear Forensics analytical process that preserves sample, reduces test time from days to minutes, and eliminates MLLW generation from that process
- Installed in-line composter to eliminate off-site disposal of sanitary wastewater treatment sludge

Waste Generation at LANL



LAWS

1990 Pollution Prevention Act; Resource Conservation and Recovery Act

Regulation

Regulator

DOE Order 435.1 Radioactive Waste Management

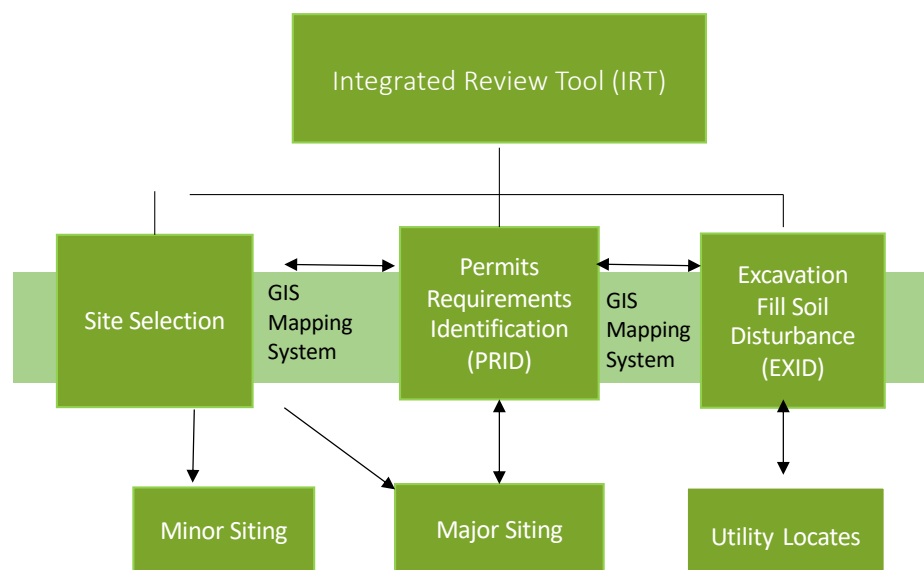
DOE

DOE Order 436.1 Departmental Sustainability

DOE

Integrated Project Review Program

The Integrated Project Review Program coordinates environmental subject matter experts who review new/modified activities and projects at LANL. The subject matter experts identify environmental compliance requirements early in planning stages of projects so requirements can be addressed, permits can be obtained, projects can proceed as scheduled without negative cost, scope, or schedule implications. The Integrated Review Tool (IRT) is a web-based entry portal into the project review tools: PRID, EXID and Siting. All new and modified activities and projects at LANL must use the IRT to identify environmental requirements that will potentially impact their work.



REQUIREMENTS

SD 400
Environmental Management System
P 351
Permits and Requirements
Identification Policy
SD 350
Management of Projects
P 941
Site Planning

CORE PROGRAMS

- Air Quality
- Biological Resources
- Cultural Resources
- Environmental Health Physics
- NEPA
- Waste & Materials Management
- Water Quality

Environmental Requirements Summary

The *Environmental Requirements Summary (ERS)* identifies each potential environmental requirement related to your project and whether it is *complete*, *in process*, or has *action required*. It is generated from PRID, should be kept on the project site for the duration of the project, and its contents should be communicated to all workers.

FUNCTION & IMPORTANCE

- Every worker on site should recognize when environmental requirements exist
- Deployed Environmental Professionals, Subcontract Technical Representatives, and other support personnel on site can request the ERS and immediately familiarize themselves with environmental requirements impacting work
- Non-compliance with environmental requirements can result in project costs, delays, and loss of credibility with our regulators

Environmental Requirements Summary

PRID: 16P-0157, Firing Point Reconfigure

Location: 39-0006

Scope: Enlarge the firing pad by excavating the hillside that has slowly slumped and encroached on the original footprint. Install a steel-faced concrete retaining wall to prevent further subsidence.

Upgrade the electrical power in the main bunker to provide convenient access to numerous 20A 110V outlets as well as several 220V single and three phase circuits. Fit the bunker with useful work surfaces and storage furniture.

Map: The GIS map contains 1 area and was last analyzed on 6/1/2016.

Date: 6/20/2017 2:58:35 PM

This PRID contains additional requirements, comments, and other pertinent information which can be located on the IRT website. The information contained in this Environmental Requirements Summary is NOT and should NOT be considered all inclusive.

Environmental Requirements	
SME Comments	Project Team Response
Air Quality: Ambient Radioactive Air Monitoring	Complete
6/3/2016 by SONJA SALZMAN for MARJORIE STOCKTON Issues/Comments: No action is required since existing Airmet stations at receptor locations will measure any potential off-site dose. Project Leader Actions: No action required.	No comments received from Project Team.
Air Quality: Refrigerant Equipment - New or Modified	Complete
6/3/2016 by SONJA SALZMAN for MARJORIE STOCKTON Issues/Comments: No action is required since project personnel do not plan to install any equipment that contains refrigerant. Project Leader Actions: No action required.	No comments received from Project Team.
Biological Resources Compliance Review	Complete
6/30/2016 by CHARLES HATHCOCK for DAVID KELLER Issues/Comments: On June 30 2016, a site visit was conducted by a biological resources SME. The area of disturbance does not contain any suitable nesting substrate and no nests were found. No follow-up checks are required. Thanks for your support with this requirement. Project Leader Actions: None. 6/7/2016 by BRENT THOMPSON for DAVID KELLER Issues/Comments: Migratory Bird Protections The federal law, the Migratory Bird Treaty Act, prohibits killing migratory birds, including nestlings and eggs. Project Leader Actions: The regulatory risk to LANL is from the destruction of active nests, which are nests with eggs or nestlings, during vegetation removal operations. Therefore, tree and shrub removal is not permitted between May 15 and July 31 of any given year (the peak bird-nesting season). During this time, EPC-ES biologists can survey trees and shrubs immediately prior to removal, but active nests that are found cannot be disturbed and the operation	6/30/2016 by LARRY VAUGHAN Inspection was conducted today no nesting sites in area that is to be disturbed. 6/7/2016 by LARRY VAUGHAN Inspection has been scheduled 6/7/2016 by LARRY VAUGHAN Contacted SME and have agreed to have site inspected 5 working days before work is to begin 6/7/2016 by LARRY VAUGHAN Gentlemen, you can come to the site and do your inspection as needed. I am at the site on a regular bases

NEPA Compliance and SWEIS

The objective of the National Environmental Policy Act (NEPA) is to ensure that environmental issues are considered in the decision to authorize activities. To fulfill this requirement, proposed work at LANL must be reviewed to determine if it is covered by an existing NEPA document or, if it is not, the level of NEPA documentation required.

ACCOMPLISHMENTS

- In 2016, the DOE determined proposed modifications to Metropolis Center supercomputers would not adversely affect the environment and would in fact support the next generation of supercomputers at the Laboratory
- In 2016, a categorical exclusion was written for the proposed use of unmanned aerial systems (such as drones and remote control aircrafts) for security, research, and emergency management within Laboratory restricted airspace. A categorical exclusion means the proposed actions do not require further environmental analysis because they do not pose a significant effect on the human environment
- Supplement Analysis for Treatment, Repackaging, and Storage of Nitrate Salt Waste Drums, DOE/EIS-0380-SA-04
- Supplement Analysis to the Environmental Assessment for Chromium Plume Control Interim Measure and Plume-Center Characterization, DOE/EA 2005-SA-001
- Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operations of Los Alamos National Laboratory, DOE/EIS-0380

EVALUATION AND DECISION MAKING TOOLS

- LANL has a Site-Wide Environmental Impact Statement (SWEIS) and project-specific EISs for projects not evaluated during the last SWEIS
- Mitigation Action Plan created after Records of Decision (RODs) to reduce impacts
- Environmental Assessments
- Categorical Exclusions
- Findings of No Significant Impact

Laws

National Environmental Policy Act

Trails Management Program

In 2003, the DOE established a trails management program at the Laboratory. DOE/NNSA published the Final Environmental Assessment for the Proposed Los Alamos National Laboratory Trails Management Program (EA) and a Finding of No Significant Impact (FONSI) in September 2003. The EA also contains a Mitigation Action Plan with specific trails-related mitigations, including the establishment of the Trails Working Group, which functions as a collaborative forum for stakeholders.

GOALS:

- Reduce the risk of damage and injury to property, human life, and health, and sensitive natural and cultural resources from social trail use at LANL
- Facilitate the establishment of a network of linked trails across the Pajarito Plateau that traverse private and government entities without impacting DOE/NNSA and DOE/Environmental Management mission support work
- Maintain the security of LANL operations
- Respect the wishes of local Pueblos to maintain access to traditional cultural properties (TCPs) by Pueblo members while also preventing unauthorized public access to adjacent Pueblo lands
- Adapt trail use at LANL to changing conditions and situations in a responsive manner
- Maintain the recreational functionality of the DOE lands in compliance with federal laws and LANL operational constraints



TAKING CARE OF OUR TRAILS

Continued access and use of Los Alamos National Laboratory trails is contingent upon being good stewards of these federal lands.

Biological Resources

Two federal laws drive biological resource management and compliance at the Laboratory.

LAWS	Applies onsite to:
Endangered Species Act	Threatened & Endangered Species = Mexican Spotted Owl; Southwestern Willow Flycatcher; Jemez Mountains Salamander; New Mexico Meadow Jumping Mouse; Yellow-billed Cuckoo
Migratory Bird Treaty Act	All native birds on site. This law prohibits the killing of migratory birds including their nestlings or eggs.

ACCOMPLISHMENTS

- Work with management to address human-wildlife conflicts as needed
- All staff are members of professional organizations that promote the research and conservation of wildlife resources
- Partner with multi-agency, and multi-stakeholder groups locally and regionally to address pertinent natural resource issues



ACTIONS

- Review ~ 1000 projects per year for compliance issues through Integrated Project Review
- Develop project specific assessments for projects that cannot follow the HMP requirements
- Educate community and LANL workforce about wildlife resources, their habitats, and their management



Cultural Resources

Under the National Historic Preservation Act (NHPA), federal agencies must act as responsible stewards for cultural resources on their properties. A Programmatic Agreement between DOE NA-LA and the State Historic Preservation Officer (SHPO) streamlines the compliance process. It is implemented by the Cultural Resource Management Plan, which outlines how the Laboratory manages the more than 1700 archaeological sites and more than 400 historic buildings on LANL property.



ACCOMPLISHMENTS

- 90% of Laboratory property has been surveyed for archaeological sites
- A permanent archaeology exhibit at the Bradbury Science Museum highlights the archaeology of the Pajarito Plateau and provides outreach on cultural resource management at LANL
- A historic context document on fieldhouses of the Pajarito Plateau was published in 2018

Laws

Antiquities Act

Native American Graves Protection & Repatriation Act

National Historic Preservation Act

Native American Religious Freedom Act

ACTIONS

- Document cultural resources and assess eligibility for listing in the National Register of Historic Places
- Review potential impacts to cultural resources from projects and activities through Integrated Project Review
- Help projects to avoid impacts to cultural resources or mitigate these impacts
- Develop long-term strategies for cultural resource management on LANL property

Manhattan Project National Historical Park

The 2015 National Defense Authorization Act directed the Department of Energy (DOE) and the Department of the Interior (DOI) to establish a new national historical park to preserve the historic resources of the Manhattan Project. An MOA signed by DOE and DOI on November 10, 2015, established the Manhattan Project National Historical Park (MAPR). The MOA identifies nine properties at the Laboratory located within three areas that are now part of the park. Eight additional Laboratory properties were identified in the legislation as park-eligible properties and could be included in the park in the future.

PARK PROPERTIES AT LANL

Gun Site: The three bunkered buildings at TA-8 supported the design and component testing of the “Little Boy” bomb.

V-Site: The buildings at TA-16’s V-Site were used to test early “Fat Man” weapon prototypes. The main high-bay building was used to assemble the high-explosives components of the Trinity device in July 1945.

Pajarito Site: TA-18 was used during the Manhattan Project as a site for plutonium chemistry research, as an implosion firing site, and as a site for critical assembly experiments.



Laws

2015 National Defense Authorization Act

National Historic Preservation Act



Soils, Foodstuffs and Biota Monitoring

The goals of the Soils, Foodstuffs, and Biota program are to determine whether Laboratory operations are affecting chemical concentrations in several types of environmental media and to assess environmental health by evaluating several ecological parameters. To accomplish these goals, samples are collected from on-site at the Laboratory, from perimeter locations, and from regional background locations for comparisons. The Laboratory has conducted environmental monitoring since the early 1970s and is constantly improving and adjusting both sampling methods and locations.

ACCOMPLISHMENTS

- Developed procedures to support implementation of DOE Order 458.1
- Supports Land Transfer Program through sampling and dose assessment
- Publish results in the Annual Site Environmental Report and select peer review publications

TYPES OF MONITORING

- Analyze radionuclides, trace elements, and organic chemicals in environmental media such as:
 - Soil and sediment
 - Fruits, vegetables, milk, eggs, fish, meat
 - Native vegetation, small mammals, bees
- Assess benthic macroinvertebrates community assemblages
- Conduct sediment biotoxicity assays
- Evaluate population parameters (e.g., mark-recapture small mammal studies)

Regulation	Regulator
DOE Order 231.1B, Environment, Safety and Health Reporting	DOE
DOE Order 458.1, Radiation Protection of the Public and the Environment	DOE
DOE Order 436.1, Departmental Sustainability	DOE



Health Physics: Environmental Radiation Protection

DETERMINING RADIOLOGICAL DOSES

Determining radiological dose impacts from past and current Laboratory operations via following pathways:

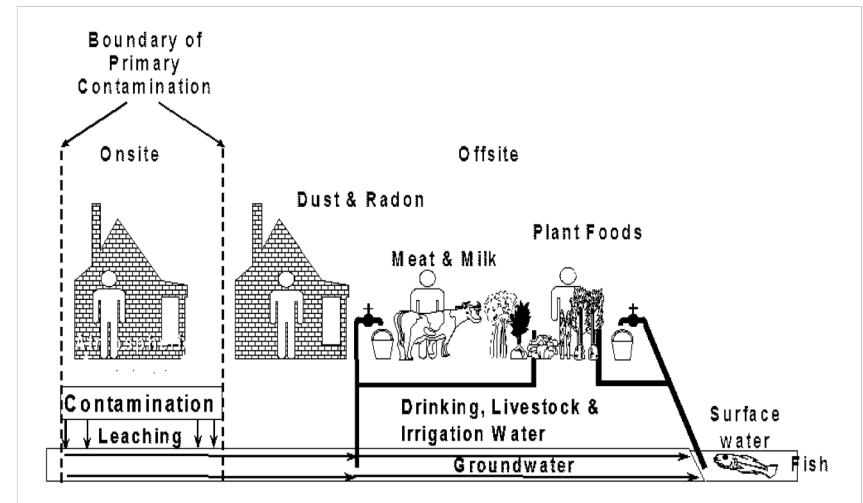
- Air emissions (diffuse and stacks)
- Direct radiation measurements
- Foodstuffs, Soils, Biota
- Drinking water

RESULTS

- 2014 maximum all pathway dose was 0.24 millirem ($\ll 100$ mrem limit)
- Airnet shows no measurable impact at regional stations
- Comprehensive program to evaluate new operations, major & minor sources, and adapt to changing LANL and public locations

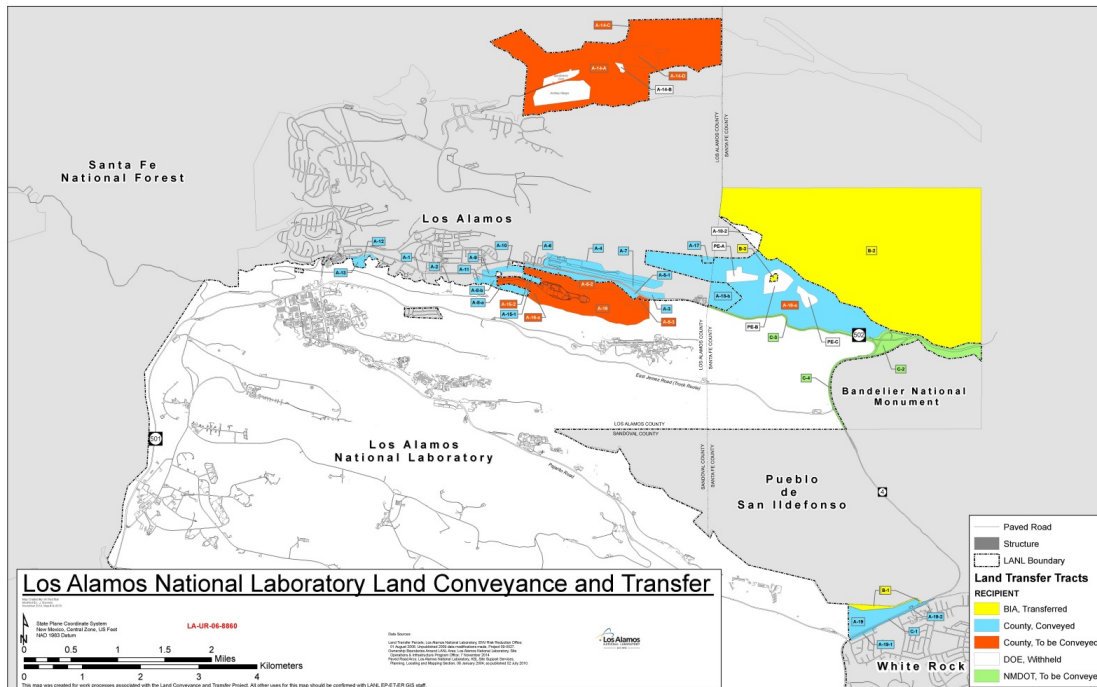
PATHWAY ASSESSMENT LIMITS

- Air (Radionuclide NESHAP) pathway – 10 millirem per year limit
- All pathways – 100 millirem per year limit
- Natural background radiation results in ~500 millirem per year; LANL all-pathway contribution is about 1 millirem or less.



Regulation	Regulator
Coordinate compliance with DOE Order 458.1 <ul style="list-style-type: none">• Emissions of air, water• Land transfer• Property release	DOE
40 CFR 61, Subpart H (Rad.-NESHAP)	EPA

Land Transfer



Law

Required under Public Law 105-119

RESULTS

- Three tracts totaling nearly 90 acres were conveyed to Los Alamos County in January 2018
- Working to convey Tracts A-16-b in DP Canyon, A-15-2 (a segment of DP Road), and A-18-2 in Bayo Canyon to Los Alamos County
- The road tracts C-2 and C-4 will be conveyed to Los Alamos County
- Supports local community economic development by providing lands for housing, commercial uses, and for recreation

Public Law 105-119 requires conveyance or transfer of tracts of DOE property no longer in use to government entities to support local economic development and cultural and natural resources preservations. Government entities include:

- Los Alamos County
- Los Alamos County School District
- Bureau of Indian Affairs to be held in Trust for the Pueblo de San Ildefonso

Annual Site-Wide Environmental Report

The Los Alamos National Laboratory Environmental Report is intended to inform the public, tribal governments and other stakeholders of the results of environmental monitoring conducted at Los Alamos National Laboratory.

FUNCTION

- Characterize LANL's environmental performance, including effluent releases, environmental monitoring, and estimated radiological doses to the public and the environment
- Summarize environmental occurrences and responses
- Confirm compliance with environmental standards and requirements
- Highlight significant programs and efforts



Regulation	Regulator
DOE Order 231.1B Admin Chg 1., DOE. Environment, Safety and Health Reporting	DOE
DOE Order 458.1 Chg. 3, Radiation Protection of the Public and the Environment	DOE

Natural Resources Damage Assessment

The Trustee Council was established to evaluate the impacts of releases of hazardous substances to natural resources and to ensure the restoration of resources or acquisition of equivalent natural resource services.

PROCESS

When a hazardous substance is released it may cause injuries to natural resources. Injuries then can result in the loss of services (such as recreational fishing) from those resources. Federal law requires the party responsible for the release to restore the resource services and pay for the damages.

LANL'S ROLE

- Support for DOE in the Trustee Council
- Review of Trustee Council products
- Provide and publish data on the status of natural resources at LANL



Laws

Comprehensive Environmental Response, Compensation, and Liability Act of 1980

Oil Pollution Act of 1990

Air Quality Permitting and Compliance

LANL monitors many different pathways to assess potential impacts on workers, the public, animals, and plants. We monitor the air around the Laboratory to ensure our operations are not affecting the air of nearby communities.

PROGRAM AREAS

- Title V Operating Permit
- Construction Permitting
- Stratospheric Ozone Protection
- Asbestos/Demolition Notifications
- Greenhouse Gas Reporting
- Emergency Planning and Community Right-to-Know Act (EPCRA) Reporting
- Radioactive Air Emissions
- Ambient monitoring (RAD & PM)
- Meteorology



Law	
Clean Air Act	
Regulation	Regulator
40 CFR 50-99	EPA
20.2 NMAC	NMED
EPCRA Section 313 – Toxic Release Inventory Reporting	EPA
Permit	Regulator
Title V Operating Permit P100	NMED
NSR Construction Permits, various	NMED
Department of Energy Orders	Regulator
DOE Order 151.C, Emergency Management Systems	DOE
DOE Order 231.1B, ES&H Reporting	DOE
DOE Order 436.1 Departmental Sustainability	DOE
DOE Order 458.1, Environmental Radiation Protection	DOE

Air Quality Title V Operating Permit

The Air Quality Program maintains the Laboratory Title V Operating Permit P100 for all LANL air emissions. The permit specifies emission, operating, monitoring, and record keeping requirements for all emission units. Permit requires extensive semi-annual emission and monitoring reports as well as an annual compliance certification.

Title V Operating Permit Emission Sources

- Asphalt Plant Operations
- Beryllium Operations
 - TA-3-66, TA-3-141
 - TA-35-213, TA-55 PF-4
- External Combustion (Boilers)
- LANL-wide Chemical Usage
- Degreasers
- Internal Combustion (Generators)
- Data Disintegrator
- Power Plant: 3 Large Boilers, Combustion Turbine
- Prescribed Burning



Regulation	Regulator
40 CFR 70 – Operating Permit Program	DOE
20.2.70 NMAC – Operating Permits	NMED
Permit	Regulator
Title V Operating Permit P100	NMED

Air Quality Programs

CONSTRUCTION PERMITTING

- NSR 2195 Exemption Notices
- NSR 2195-B TA-3 Power Plant & Combustion Turbine
- NSR 2195-F TA-33 Generator
- GCP3-2195-G Asphalt Plant
- NSR 2195-H Data Disintegrator
- NSR 2195-N CMRR RLUOB
- NSR 2195-P TA-33 Diesel Generators
- NSR 632 TA-35-213 Beryllium
- NSR 634 TA-3-141 Beryllium
- NSR 1081 TA-55 Beryllium

GREENHOUSE GAS (GHG) REPORTING

- The Laboratory submits a combined annual report through EPA's e-GGRT reporting system for LANL's combustion sources
- The Laboratory submits an annual report to DOE for all Green House Gas emissions, which includes LANL direct emissions, purchased electricity and indirect emissions

Regulation	Regulator
40 CFR 82 Protection of Stratospheric Ozone	EPA
40 CFR 50-99	EPA
20.2.72 NMAC - Construction Permits	NMED
Regulation	Regulator
40 CFR 61 Subpart M – National Emission Standard for Asbestos	NMED
40 CFR 98 Mandatory Greenhouse Gas Reporting	EPA
EPCRA Section 313 – Toxic Release Inventory Reporting	EPA

EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT (EPCRA) REPORTING

- Reports submitted to EPA each June
- Lead is the predominant chemical reported by LANL

ASBESTOS/DEMOLITION NOTIFICATIONS

LANL notifies NMED of asbestos removal and demolition through NMED's on-line notification tool

STRATOSPHERIC OZONE PROTECTION

- LANL owns and operates more than 1200 pieces of refrigeration equipment
- Maintains records of maintenance, repair and disposal and refrigerant use
- LANL has phased out all Class 1 ODS, and is currently working to phase out Class 2 ODS equipment
- Program regulated by EPA Region 6

***New Mexico Environment Department (NMED) issues construction permits**



Radioactive Air Emissions

Monitoring radioactive air emissions works to evaluate potential impacts Laboratory operations have on members of the public.



FOCUS AREAS

- Emissions measurements from major sources
- Ambient air measurements at public receptor locations
- Public dose assessment
- Reporting to EPA, public

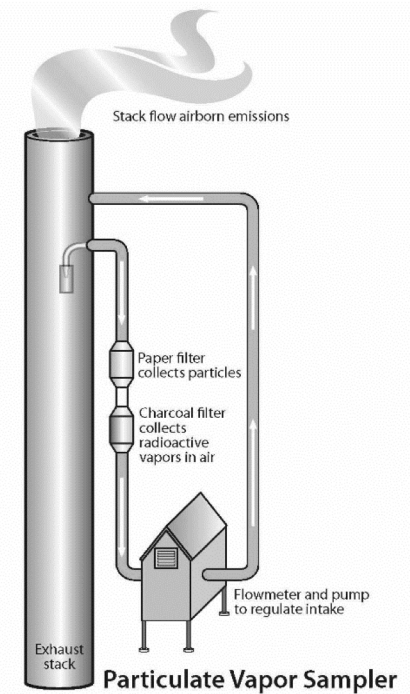
Regulation	Regulator
Clean Air Act	EPA
40 CFR 61 Subpart H, Radionuclide NESHAP	EPA
DOE Order 458.1, Environmental Radiation Protection	DOE
DOE Order 231.1B, ES&H Reporting	DOE

Radionuclide NESHAP Stacks Program

The Radionuclide NESHAP (National Emissions Standards for Hazardous Pollutants) program measures and/or calculates emissions from LANL exhaust stacks. There are 28 monitored stacks (major sources), and about 80 non-monitored minor sources.

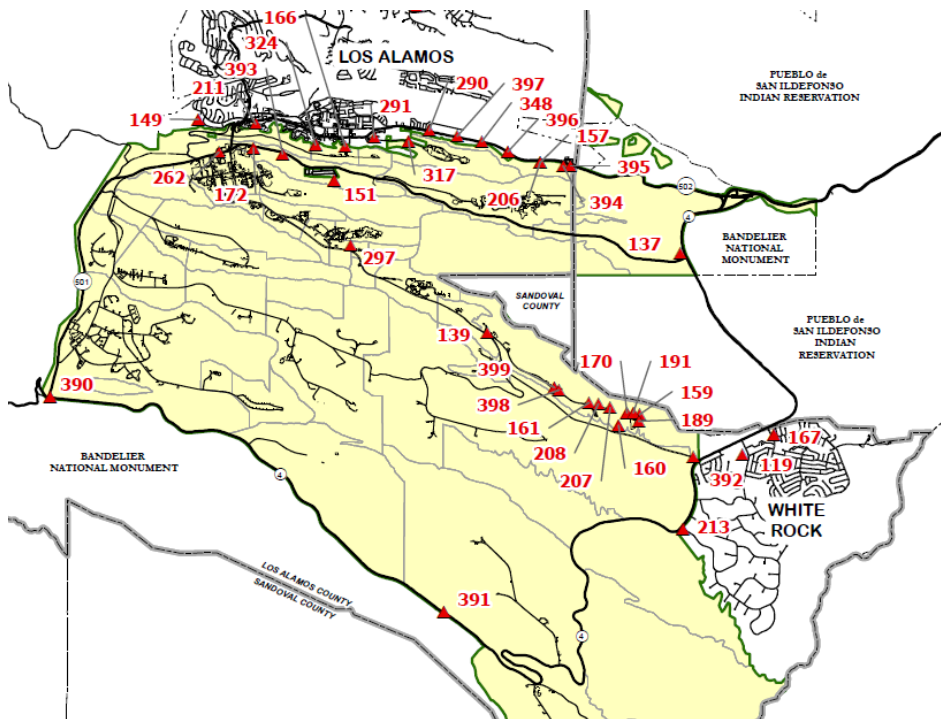
PERFORMED TASKS

- Weekly sample collection & off-site analysis
- Real-time emissions measurements from select facilities
- Emissions calculations
- Dose assessment
- Stack engineering, maintenance & performance testing



AIRNET

There are 40 air sampling stations in continuous operation around LANL perimeter, on-site near certain diffuse sources, and in regional locations for background monitoring.



FUNCTION AND TASKS

- Bi-weekly change out (2 week runs)
- Samples are analyzed for particulates (Pu, U) and tritium in water vapor

RESULTS

Results posted to IntellusNM.com, in EPA report, and in Annual Site Environmental Report

- High-volume air sampling stations available for monitoring Particulate Matter (PM) during emergencies
- Real-time particulate monitoring stations in Los Alamos and White Rock for measuring air quality
- Remote start for emergencies
- Also used for significant cleanup operations

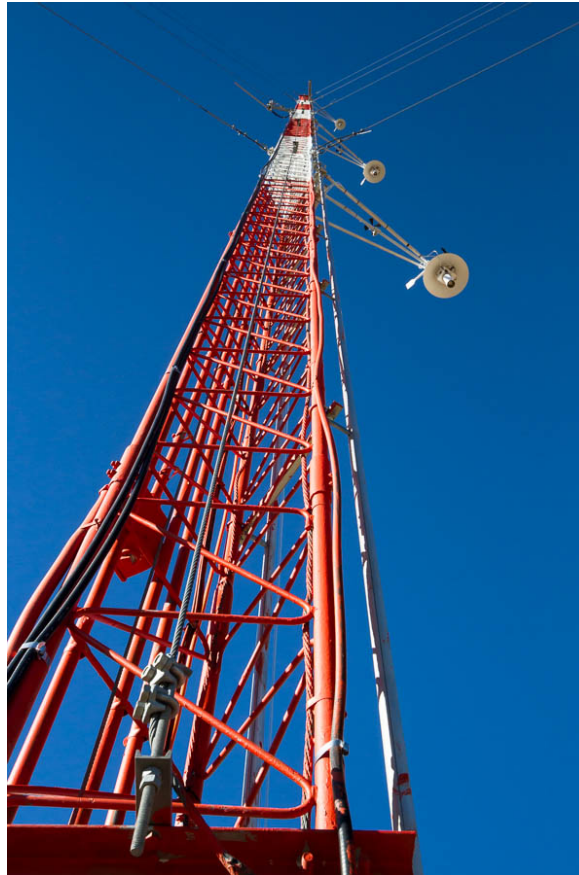
***NMED OVERSIGHT BUREAU MAINTAINS PARALLEL MONITORING SITES**

Meteorology

There are five meteorology towers located around the Laboratory. The towers collect 15-minute average data on wind, temperature, and precipitation. Real-time web data and quality assurance checks are also available.

PROGRAMS

- Plume dispersion modeling
- LANL construction standards
- Inclement weather forecasting
- Emergency response
- Safety basis



Regulation	Regulator
Nuclear Safety Management 10 CFR 830	DOE
DOE Order 151.C, Emergency Management Systems	DOE
Clean Air Act	EPA

Water Quality Permitting and Compliance

PROGRAM AREAS

- National Pollutant Discharge Elimination System (NPDES) Permits
- NM Ground Water Discharge Plans
- Pesticides
- Water Quality Control Commission (Spills, NOIs, WQS)
- Spill Prevention and Above-Ground Storage Tanks
- Septic and Holding Tanks
- Dredge and Fill Permits

Permit	Regulator
Dredge & Fill Permits	Army Corps
Department of Energy Orders	Regulator
DOE Order 450.1, Environmental Protection Program	DOE



Law	
Clean Water Act, Title 33 U.S.C. 1251	
Clean Water Act Sections 401, 402 and 404	
New Mexico Water Quality Act	
Regulation	Regulator
Code of Federal Regulations 40CFR 112 and 122	EPA
NDPES Permits (outfalls and storm water)	EPA
Petroleum Storage Tank Regulations (20.5 NMAC)	NMED
New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection (20.6.2 NMAC)	NMED
State of New Mexico Standards for Interstate and Intrastate Streams (20.6.4 NMAC)	NMED

NPDES Industrial Outfalls

NPDES Industrial and Sanitary Outfall Permit consists of 11 industrial and sanitary discharges, and is co-permitted with NMED.

RESULTS

Outfall Reduction Project

- *Reduced the number of outfalls from 141 to 11.*

Zero Liquid Discharge (ZLD)

- *HEWTF*
- *RLWTF*

Sanitary Effluent Reclamation Facility (SERF)

- *Collects treated effluent from the SWWS and, after treatment, redistributes for use as cooling water to the Strategic Computing Center, LANL's world-class, mission-critical computing facility*

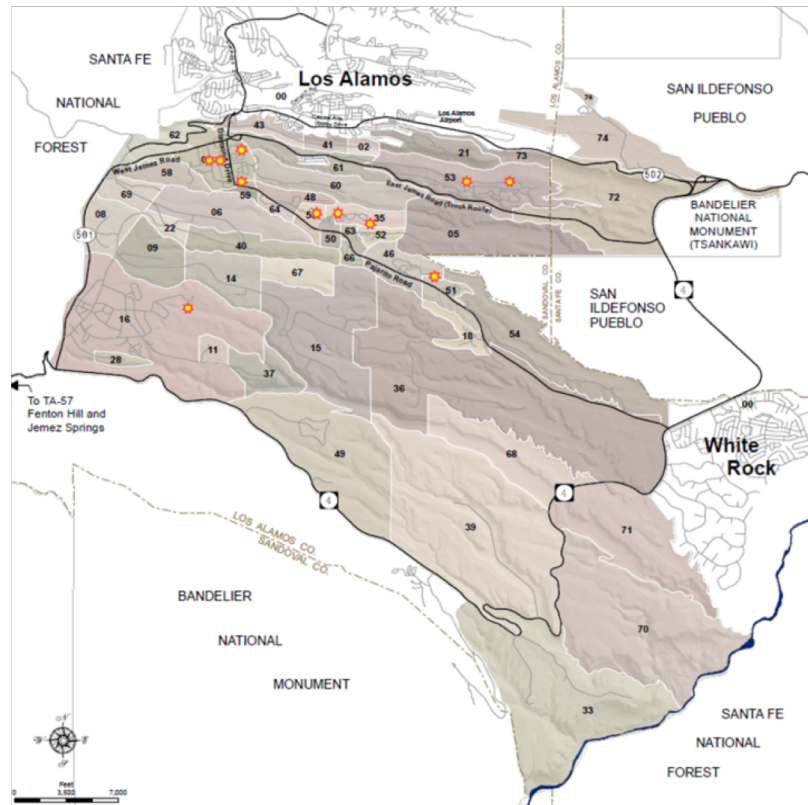
***NMED CERTIFIES NPDES PERMITS PRIOR TO ISSUANCE BY THE EPA**

Effective Oct. 1, 2014

Modified May 1, 2015

INDUSTRIAL & SANITARY OUTFALL LOCATIONS

- Power Plant Outfall (001)
- RLWTF Outfall (051)
- SWWS Plant Outfall (13S)
- HEWTF Outfall (05A055)
- SCC Cooling Tower [CT]
- Outfall (03A027) LDCC CT Outfall (03A199)
- TA-53 CT Outfalls (03A048 & 03A113)
- TA-55 CT Outfall (03A181)
- Sigma Outfall (04A022)
- TA-35 CT Outfall (03A160)



NPDES Industrial Outfall Permit

RESULTS

Effluent from RLWTF and SERF meets or exceeds drinking water standards

AREAS OF COVERAGE

- Cooling Tower Discharges (7)
- Wastewater Treatment Discharges
 - SWWS
 - RLWTF
 - HEWTF
 - Power Plant / SERF
- Effluent Limits
- Monitoring and reporting requirements



Permit

NPDES Permit No. NM0028355

Department of Energy Orders

DOE Order 450.1, Environmental Protection

Regulator

EPA

Regulator

DOE

Law

New Mexico Water Quality Act

Clean Water Act, Title 33 U.S.C. 1251

New Mexico Water Quality Act

Clean Water Act Sections 401 (State Certification) and 402 (NPDES Permit)

Regulation

State of New Mexico Standards for Interstate and Intrastate Streams (20.6.4 NMAC)

Code of Federal Regulations 40CFR122

Regulator

NMED

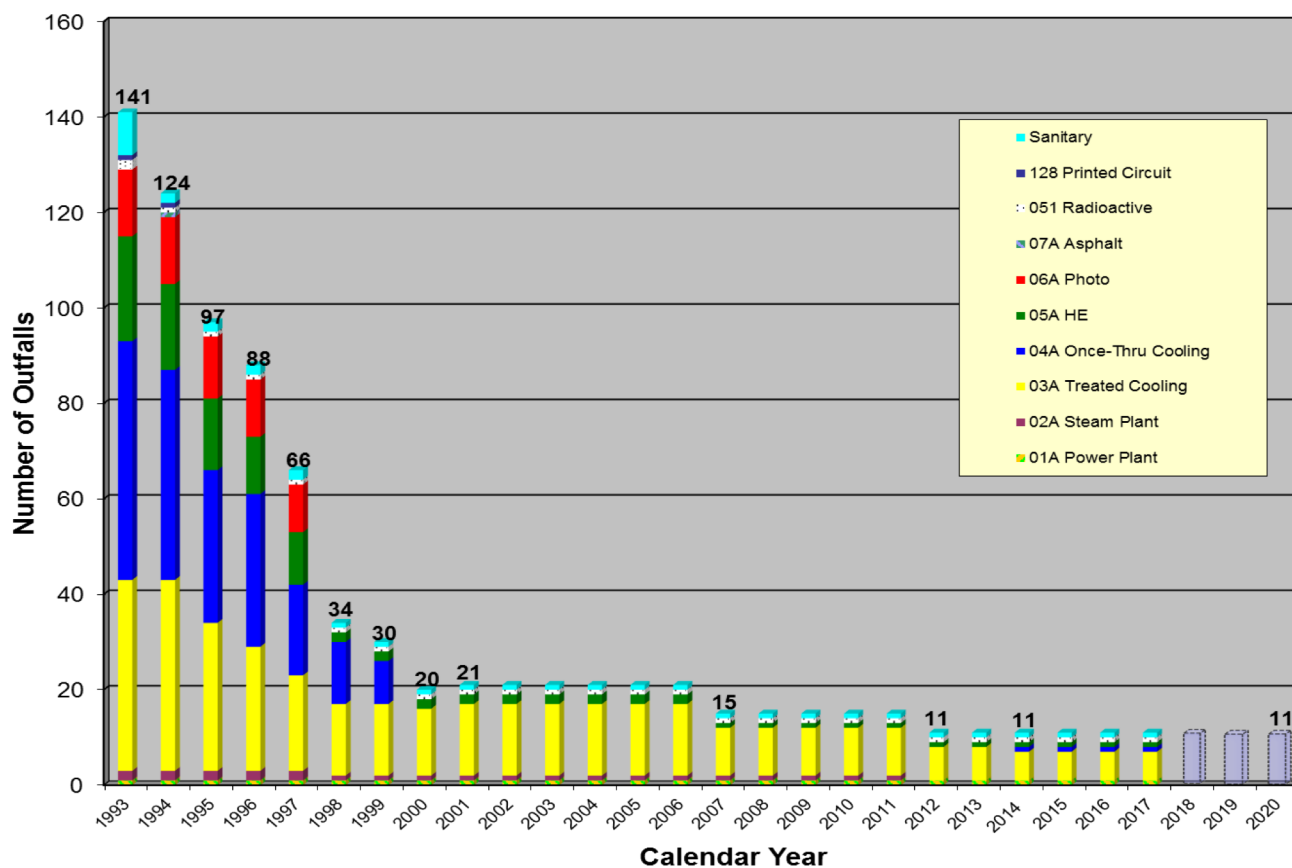
EPA

Zero Liquid Discharge/Outfall Reduction Strategy

In 2006 the new Zero Liquid Discharge (ZLD) Strategy was developed to meet more stringent NPDES effluent limits.

ELEMENTS

- RLWTF – Using Gas-fired evaporator, and passive solar evaporation tanks
- SERF Expansion Project completed and operational July 2012
- Reuse water in SCC cooling towers and Power Plant Boilers
- HEWTF – No discharge to canyon since 2007
- Outfall Reduction- Ongoing evaluation of reuse in Cooling Towers



Above Ground Storage Tanks

Effective management of Aboveground Petroleum Storage Tanks help the Laboratory protect surface and ground water quality from petroleum releases. There are 14 tanks that are registered annually by NMED. An additional 12 tanks are regulated solely by the EPA.

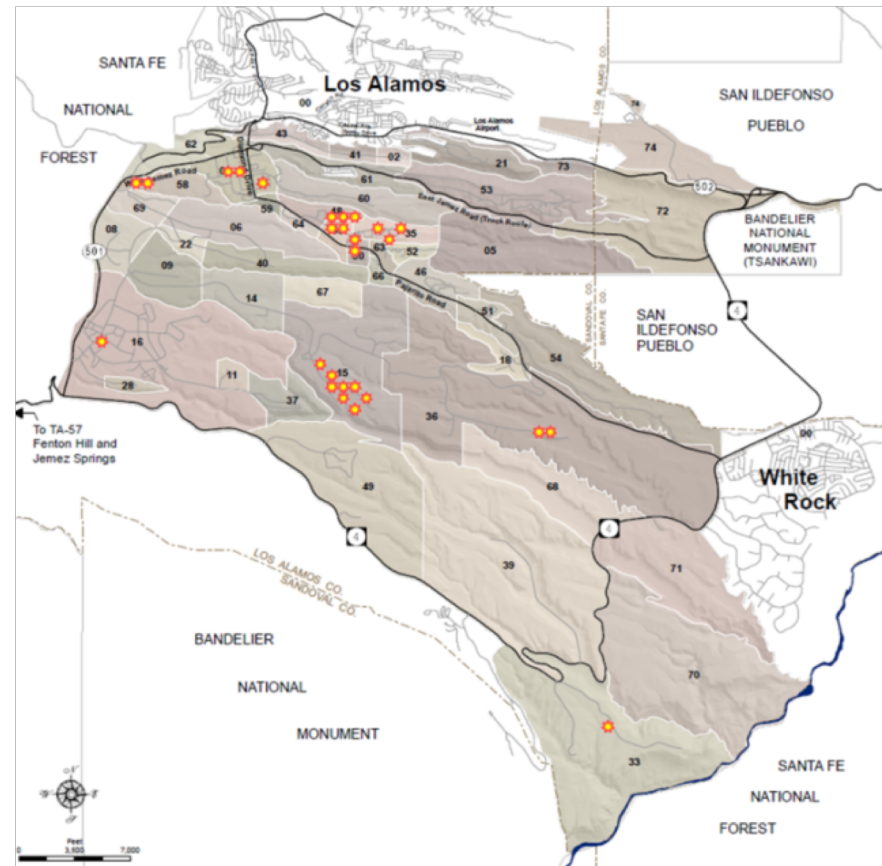
NMED and EPA Regulated Tanks

- 3-1404-Power Plant
- 3-1498-LDCC
- 3-2459-SAS NMSSUP
- 15-435-DARHT
- 15-436-DARHT
- 16-980-WETF
- 33-290-TA-33
- 35-301-NHMFL
- 55-362-TA-55
- 55-364-TA-55
- 55-551-TA-55
- 55-560-RLUOB
- 69-53-EOC
- 69-54-EOC

EPA Regulated Tanks

- 03-2382-Power Plant
- 33-UI Mobile Generator
- 48-270
- 48-271
- 55-PF8
- 55-261
- 55-262
- 55-267
- 55-371
- 55-583-RLUOB
- 55-584-RLUOB
- 55-585-RLUOB

***NMED and EPA REGULATES
AND INSPECTS ASTs**



NPDES Storm Water General Permit

RESULTS

- New Permit issued by EPA on February 16, 2012
- New Permit much more stringent than previous permits
- 332 inspections conducted FYTD
- Working with ADPM to adapt LANL standards & contract requirements to support the new Permit requirements

AREAS OF COVERAGE

- Construction activity > 1 acre including "common plan of development"
- Storm Water Pollution Prevention Plans
- Best Management Practices
- Weekly & rain event inspections
- Recordkeeping & personnel training
- Corrective Action requirements
- Site stabilization requirements
- Impaired waters requirements
- Additional NMED requirements for runoff velocity & sediment yield
- ~ 19 Regulated Sites
- New Permit Issued February 2012

PROJECTS SUBJECT TO CGP

- CHQ-SMA-6 Storm Water Controls
- CrEX-1 Well Pad Construction & Support Activities
- ETA Ductbank Phase 2 2014 (LANL)
- Mortandad Canyon Sediment Traps Revitalization
- NMSSUP II Concrete Roadway - Marcon
- Pueblo Canyon Wetland Stabilization (LANL)
- RANT TRUPACT III Civil Support
- RANT TRUPACT III Fire Water Containment Basin
- TA-15 R-306 Firing Point
- TA-21 MDA B Enclosure Demolition
- TA-50 RLWTF-LLW Project (Yearout)
- TA-50 RLWTF-LLW Upgrade Project (LANL)
- TA-54 Area G Fire Alarm Relocation
- TA-55 Reinvestment Project II MSS Self Perform
- TA-72 Stormwater Controls Project
- TWF Phase B Construction

Permit	Regulator
New Mexico State Conditions of Certification	NMED
NPDES Construction General Permit	EPA

***NMED PROVIDES CERTIFICATION TO THE CGP AND INSPECTS PERMITTED SITES ON BEHALF OF THE EPA**

NPDES Storm Water Multi-Sector General Permit

RESULTS

- The number of facilities that require storm water monitoring has been reduced from 22 to 13
- Eliminated processes and pollutant sources
- Documented that pollutants are below benchmark or background levels

AREAS OF COVERAGE

- Discharges from specified industrial activities, for example
 - Metal fabrication
 - Metal foundries
 - Power generation
 - Asphalt production
 - Recycling facilities
 - Warehousing
 - Vehicle maintenance
 - Hazardous waste treatment, storage and disposal
- Facility-specific SWPP Plans
- Storm water discharge monitoring
- BMPs, inspections, personnel training
- Corrective Action requirements
- Required reporting to EPA
- Permit has been extended, with new, more stringent permit expected in 2015
- Approximately 40 facilities are subject to MSGP

FACILITIES SUBJECT TO MSGP

"No Exposure" sites with precipitation mitigations

TA-3-32
TA-3-34
TA-3-29 Machine Shop
TA-3-29 Indoor TSD
TA-3-30
TA-14-23
TA-22-52
TA-33-39
TA-33-113
TA-35-2
TA-35-125
TA-46-31
TA-48-8
TA-50-54
TA-50-69
TA-53-2
TA-53-3
TA-53-16
TA-53-18
TA-53-26
TA-53-39
TA-53-365
TA-54-38 Indoor TSD
TA-55 Outdoor TSD
TA-55-185
TA-55-314

Law	Regulator
Clean Water Act, Title 33. USC 1251 and Section 402	EPA
Regulation	
40 CFR Part 122	DOE
Permit	Regulator
Inspects site on behalf of EPA	NMED
NPDES Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity	EPA

Inactive Site

TA-15-185

Active Facilities

TA-3-22 Power and Steam Plant
TA-3-38 Metal Fabrication Shop
TA-3-39 and 102 Metal Shop
TA-3-66 Sigma Complex
TA-9-29 Heavy Equipment Maintenance
TA-54 Area G

TA-54 Area L
TA-54 Maintenance Facility West (a.k.a. MSS Laydown Yard)
TA-54 RANT
TA-60 Asphalt Batch Plant
TA-60 Material Recycle Facility
TA-60-1 Heavy Equipment Yard
TA-60-2 Warehouse
TA-60 Roads and Grounds



Groundwater Discharge Plans

The Groundwater Discharge Plans are associated with outfalls and other planned releases.

RESULTS

- NMED reissued a ground water discharge permit for SWWS to include SERF.
- Preliminary draft ground water discharge permit for RLWTF as part of the RCRA Hazardous Waste Facility permit settlement negotiations.

AREAS OF COVERAGE

- TA-46 Sanitary Wastewater Systems (SWWS) Plant and Sanitary Effluent Reclamation Facility (SERF): DP-857 (Permit issued 12/16/16)
- TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF): DP-1132 (permit pending)
- Septic Tank-Disposal Systems: DP-1589 (Permit issued 3/3/17)
- Extraction, treatment, and land application of Chromium and RDX contaminated groundwater: DP-1793 (Permit issued July 27, 2015)
- Extraction, treatment, and injection of chromium contaminated groundwater: DP-1835 (Permit issued 8/31/16)

Laws	
New Mexico Water Quality Act	
Regulation	Regulator
New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection (20.6.2 NMAC)	NMED
Permit	Regulator
Discharge Plan(DP): RLWTF DP 1132; SWWS/SERF DP 857; Pump and Treat Projects DP 1793; and, Septic Tanks DP 1589; and Pump, Test, and Inject Project DP-1835	NMED
Department of Energy Orders	Regulator
DOE Order 450.1, Environmental Protection Program	DOE



Additional Water Quality Programs

RESULTS

- Developed decision tree for planned and unplanned releases.
- Developed a decision tree matrix for land application

Laws

New Mexico Water Quality Act

Federal Clean Water Act, Section 401/404

Regulation

Regulator

New Mexico Water Quality Control Commission Regulations, Ground and Surface Water Protection (20.6.2 NMAC)

Department of Energy Orders

Regulator

DOE Order 450.1, Environmental Protection Program

DOE



SEPTIC/HOLDING TANKS

- Pumping Records to NMED
- Requirements on system modifications and construction

DREDGE & FILL PERMITS

- Work in a watercourse
- Requirements / restrictions set by USACE
- BMP requirements
- May require additional NMED certification

NMWQCC (State standards)

- Spills and unplanned releases
- Planned releases: Notice of Intent (storm, potable & process water)
- NMED notification and reporting
- Water quality standards development

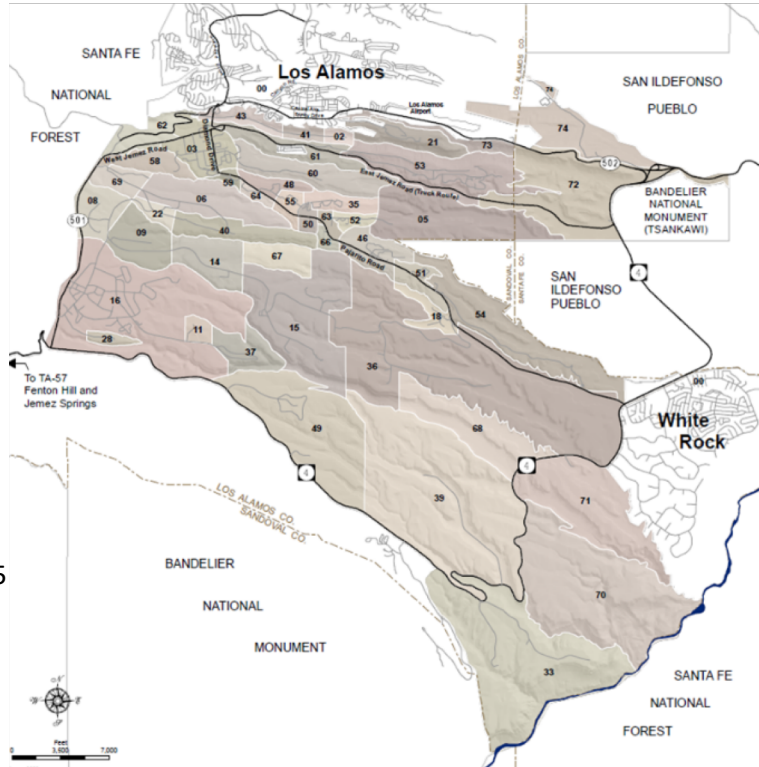
PESTICIDE GENERAL PERMIT

- Annual report to EPA

Resource Conservation and Recovery Act Compliance

TREATMENT, STORAGE AND DISPOSAL FACILITIES

TA-3 CMR (Storage)
TA-14 (OB/OD) Interim Status
TA-16 (OB) Interim Status
TA-36 (OD) Interim Status
TA-39 (OD) Interim Status
TA-50-69 (Storage)
TA-54 RANT, Area L, Area G (Storage)
TA-55 (Storage/Treatment)
TA-63 Transuranic Waste Facility (TWF)
(Storage) under construction 2014-2015



Hazardous Waste Permit & Interim Status Facilities

- Treatment, Storage & Disposal Facilities (TSDF) at 9 Technical Areas
- Container Storage
- Chemical and Physical Treatment
- Open Burning and Open Detonation of Waste Explosives

No On-Site Disposal

Hazardous Waste Generator Storage and Treatment (No permit required)

- 9 Active <90 Day Accumulation Areas
- 233 Active Satellite Accumulation Areas
- 37 Universal Waste Storage Areas
- 30 Used Oil Storage Areas

Exempt Hazardous Waste Treatment Units

- TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) Operating Under NPDES Permit
- (Current RCRA Permit includes terms and conditions for RLWTF; included in 12/2010 Appeal) 25 New Mexico Special Waste Storage Areas
- 2 Small Quantity Generator (Fenton Hill, TA-55/50 CMRR)
- 8 PCB

Hazardous Waste Facility Permit

PERMIT STATUS

- Permit Issued by NMED 11/30/2010
 - Numerous modifications being considered as mission needs change
- OB application denied when permit issued
 - Remanded to NMED by Secretary
- OD application submitted July 2011
- TWF application submitted July 2011; approved 2013
- Begin closure on TA-14, 16, 39 OD site; TA-54 Units
- CMRR awaiting future determination

PERMIT APPEAL

- Filed in federal court 12/2010 by DOJ/DOE/LANS contesting three issues
 - RLW Language
 - Area G – “Date Certain” to cease disposal
 - Definition of Regulated Unit
- NMED filed counter-claim in State Court
- Both cases stayed pending outcome of ongoing settlement discussions with federal appeals court judge as mediator. Parties: DOJ, DOE, LANS, CCNS

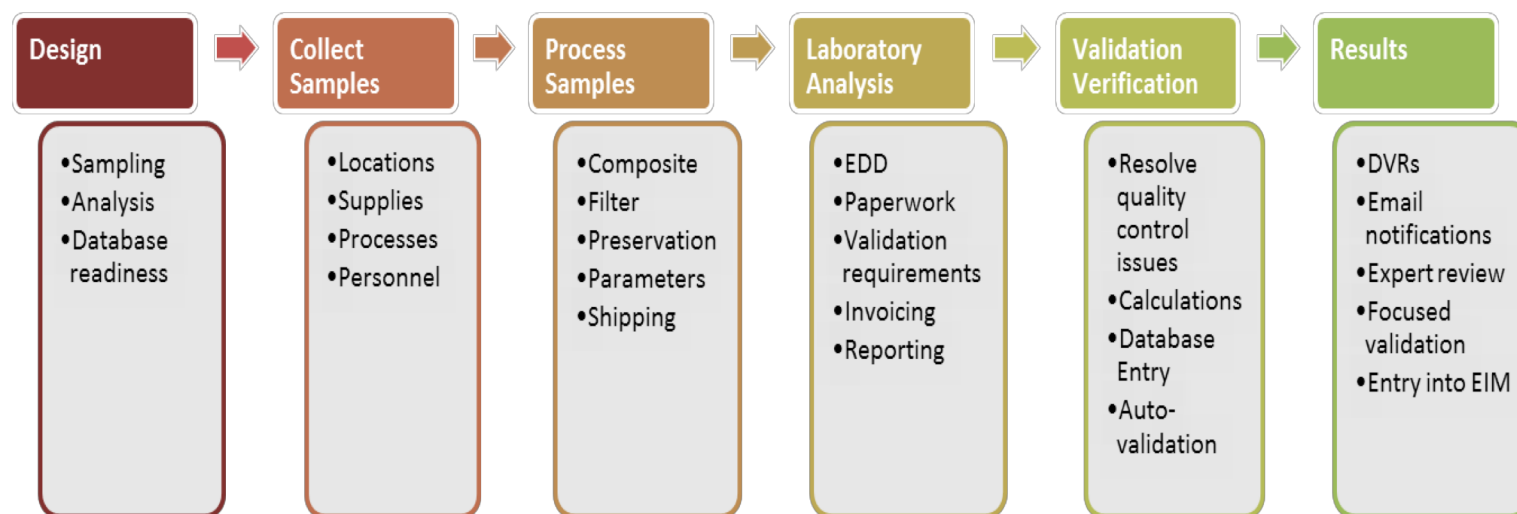
ONGOING PERMITTING ACTIVITIES

- Open Detonation Treatment Class 3 – Submitted in July 2011, pending response from the NMED-HWB
- 5 Closure Plans for Open Burn/Detonation Sites and TA-54 Storage Shafts – Submitted on July 2011, pending response from the NMED-HWB
- Open Burning Treatment Class 3 – Submitted on September 2013, pending response from the NMED-HWB
- Various Class 1 Modifications – Maintenance of the Permit
- Class 3 SWMU/AOC from Consent Order to Permit – Future
- TA-54 Storage Unit Closures – Future
- TA-55 Temporary Authorization Repackaging – Future
- TA-16 WETF Temporary Authorization for STP Waste – Future
- Treatment modification for TA-54 waste remediation –Future

Regulation	Regulator
40 CFR series	NMED
Permit	Regulator
RCRA Hazardous Waste Facility Permit	

Environmental Information Management Database

The Environmental Information Management (EIM) Database manages environmental data collected in and around Los Alamos National Laboratory by the Laboratory and the New Mexico Environment Department DOE Oversight Bureau. The database provides tools for the Laboratory and NMED to manage their environmental data from planning to reporting.



INTELLUS NM

Intellus NM serves as the public interface for environmental data collected in and around Los Alamos National Laboratory by the Laboratory and the New Mexico Environment Department DOE-Oversight Bureau. The website provides a direct view into the data used by the Laboratory and DOE-OB to make environmental decisions. Validated data are consistently formatted and automatically replicated from the EIM database every night providing timely data availability and accuracy.

Waste Management – Integrated Planning for Enduring Mission

The LANL enduring mission work utilizes much of the periodic table with corresponding waste systems. The enduring mission waste management planning was updated in February of 2016.

KEY STRATEGIES

- Minimize waste from ongoing operations
- Phase out on-site disposal of all waste types – ship off-site
- Have an open path for TRU waste to WIPP
- Replace the outdated 1960's era rad liquid waste facility
- Improve cost efficiency of waste operations
- Identify long-term waste management risks



- Minimize waste generation to maximize mission execution
- Store newly generated TRU waste at Transuranic Waste Facility pending shipment to WIPP Offsite treatment, storage, and disposal of all newly generated waste
- Relocate enduring waste operations from Area G
- Consolidate management systems across waste life-cycle
- Permitting strategy balancing EM and NNSA needs
- Rad Liquid Waste Facility construction underway
- Site cleanup and management of Moratorium metals

Waste Management – Radioactive and Hazardous Waste

FUNCTIONS AND AREA OF SERVICE

- Develops and maintains LANL waste management procedures, Waste Acceptance Criteria (WAC), QA/QC program implementation for waste profile records (WPF) and waste disposition forms (WDR)
- Supports Facility Operations Director (FOD) project planning for waste minimization, waste management projects, and decontamination and demolition waste disposition
- Provides Waste Management Coordinator (WMC) support to field projects and works to develop and maintain the capability base of the WMC teams
- Supports Development and implementation of Pollution Prevention (P2) and waste minimization strategies for FOD and institutional projects
- Maintains radioactive and hazardous waste staging and storage area registration and assessment
- Certifies waste streams and payloads for disposal at Nevada National Security Site (NNSS)
- Generate DOE O 435.1 exemption packages as needed for Los Alamos Site Office (LASO) approval for all radioactive waste shipments to commercial facilities
- Evaluates and interprets environmental and radiological regulations to ensure compliance
- Performs internal assessments facility wide to ensure LANL is compliant with environmental and radiological regulations



Waste Management – Radioactive and Hazardous Waste Characterization

The Radioactive Waste Characterization team performs assays on radioactive waste using portable high purity germanium (HPGe) systems, verification measurements on Green Is Clean (GIC) waste, and statistical calculations for radioactive characterization of Surface Contaminated Objects (SCO).

FUNCTIONS AND AREA OF SERVICE

- Utilize the HPGe systems to detect gamma rays emitted from radioactive waste
- Gather information regarding waste type, weight, and container dimensions
- Verify waste determinations and quantity of radioactive material within the waste
- Perform verifications of GIC waste. Waste that is verified clean (no detectable radiation) can be sent to a municipal landfill for disposal:
 - The GIC verification instruments are highly sensitive arrays of Phoswich detectors in well-shielded housings
- Performance of radioactive contamination calculations on surface contaminated objects (SCO):
 - SCO statistical calculations are based on sampling by Radiation Control Technicians of the contamination level per area on a surface



Waste Management – Transportation and Waste Stream Characterization Services

FUNCTIONS AND AREA OF SERVICE

- Review and approve waste stream profiles for all waste types
- Support off-site waste shipping needs by facilitating shipments of LLW, MLLW, Chem-Haz, and Non-regulated waste compliantly and in a timely and cost effective manner
- Review Waste Disposal Requests (WDRs) for LLW, MLLW, and Industrial waste and process shipping paperwork
- Provide detailed tracking info to Waste Management, Program offices, LASO and NMED on STP volumes, funding options, contract mechanisms, and logistics, as needed
- Support the DOE Consolidated Audit Program including at least two audits of hazardous or mixed waste commercial TSDF with end-of-FY report to the NNSA Field Office at Los Alamos
- Ship all Chem/Haz waste within WAC, DOT and EPA compliance
- Manage and deliver to customers containers for Chem/Haz, MLLW, LLW, NNSS and other wastes




Waste Management – Waste Characterization and Tracking System (WCATS)

The Waste Compliance And Tracking System (WCATS) is a software application that has been specifically designed to manage LANL's waste from cradle to grave.

FUNCTIONS AND AREA OF SERVICE

WCATS provides accurate tracking through:

- Waste characterization, waste generation, waste processing, and waste shipments at LANL
- A task-based system designed to perform a wide range of treatment, storage, disposal, administrative, and characterization based activities
- Inventory management including, waste storage and disposal, buildings, rooms, and grid layouts (x, y, z) throughout the LANL facility
- Ready accommodation of new facilities, processes, and work-flow requirements, via end-user established metadata. In addition, the application supports the characterization and management of the entire range of hazardous and radioactive wastes (TRU, MTRU, LLW, MLLW, and other solid waste) that might be co-located or processed at a permitted facility



WCATS
WASTE COMPLIANCE & TRACKING SYSTEM

TREATMENT TASK PROFILE

88267
EXECUTED
3/17/10 11:15 am

A: General Information:

Task Identifier: 88267

Task Name: LANL-55-PF4 - PACIG-ITEMS

Originating Facility: LANL - Technical Area 55 - PF4 (Not Specified)

Destination Facility: LANL - 55-PF4 (Waste Packaging)

Task Date/Time: 3/17/10 11:15 am

Cost Codes:

Status: Executed

Insert Date/Time: 3/17/10 11:16 am Last Edit Date/Time: 3/17/10 11:34 am

B: Input Containers

Labeled ID	Rejected	Reason	Container Type	Gross Weight	Tare Weight	Waste Weight	Partition Method	Grid X	Grid Y	Grid Z
ASHAAP205 No 30	No		BA 0 gal	5 kg	0 kg	4 kg	Item			
ASHAAP205 No 31	No		BA 0 gal	5 kg	0 kg	4 kg	Item			

C: Process Results

Labeled ID	Container Type (Vol.)	Material Description	Hold-Up Volume	Mass Transfer	Volume Transferred	Mass Transferred	Partition Method	Content Processed	Partition Percent
ASHAAP20530 20002	DM (55 gal)		No	0.00E+000 L	0 kg	0 kg	Item	No	0
ASHAAP20531 20002	DM (55 gal)		No	0.00E+000 L	0 kg	0 kg	Item	No	0

D: Holdup

Labeled ID	Partition Percent	Waste Stream Name

E: Checklist Reviews

Question	Response	Critical Response	Explanation	Date/Time

F: Signature

Signator Title	Order Number	Sig ID	Terms	Approval	Name	Date/Time
Waste Packaging Technician	1	92	I certify that the packaging has been conducted in accordance with the current procedure and all attributes are correctly recorded.	Approved	JASON E KRYLOWICZ	3/17/10 11:34 am

3/24/10 3:55 pm

Task Profile not
Official Use Only

1

Waste Management Tools

LANL Policy P409, Waste Management, is accompanied by a comprehensive series of tools that help guide waste generators in all aspects of compliant waste generation, characterization, certification, packaging, transport and disposal. These tools are available on-line with assistance from Waste Management Division subject matter experts.

100 Series Tools – General Information

- **Including but not limited to...**
 - Waste management glossary,
 - Process flow charts and planners,
 - Compatibility determinations, and
 - Changes in WCATS

200 Series Tools – Hazardous Waste

- **Including but not limited to...**
 - Containers and contaminated material, and
 - Management of waste by generators

300 Series Tools – Radioactive Waste

- **Including but not limited to...**
 - Potentially radioactive or mixed investigation- derived waste,
 - Management of waste,
 - Package guidance,
 - Characterization, and
 - Procurement requirements

500 Series Tools – NM Special Waste

- **Including**
 - **Management of New Mexico Special Waste**

600 Series Tools – Transport of Waste

- **Including but not limited to...**
 - Container closure for transportation, and
 - Use and closure checklists

700 Series Tools – Other

- **Including but not limited to...**
 - Managing UNP waste,
 - Batteries,
 - Materials and containers,
 - Suspension,
 - PCB waste, and
 - Management of waste sharps

800 Series Tools – TSF

- **Including but not limited to...**
 - Permitted units and storage requirements,
 - Analysis, contingency, and inspection plans,
 - IRF and instructions, and
 - TSF operating records

900 Series Tools – Treatment

- **Including but not limited to...**
 - Neutralization,
 - Sorption without a permit, and
 - treatment by different processes.